

# CS525 Open-Book Final Exam

Wednesday, December 18, 1996

12:25 p.m., 594 Van Hise

Answer all questions: 1, 2, 3. If any question is missing from your sheets, inform the instructor.

Each of Problems 1, 2 and 3 can be completely solved by 2 pivots only.

Last Name (Print): \_\_\_\_\_

First Name: \_\_\_\_\_

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## Grades

1. **Question 1:**—————
2. **Question 2:**—————
3. **Question 3:**—————
4. **Total:**—————

1. (10 points)

$$\begin{array}{ll} \text{minimize} & \frac{x_1^2}{2} - x_1x_2 + \frac{x_2^2}{2} + 8x_1 - 2x_2 \\ \text{subject to} & x_1 + 2x_2 \geq 1 \\ & x_1 - x_2 \geq -7 \\ & x_1, x_2 \geq 0 \end{array}$$

## Problem 1 Sheet

2. (10 points) Solve:  $\min_{x \geq 0} \|Ax - b\|_\infty$  for the system  $Ax = b$ :

$$\begin{aligned}x_1 + x_2 &= 1 \\x_1 - x_2 &= -2\end{aligned}$$

Note that  $x \geq 0$ .

## Problem 2 Sheet

3. (10 points) Solve for all values of the parameter  $t$  in the interval  $(-\infty, \infty)$ . Fill in the summary table on the next page with three columns: parameter  $t$  range, minimum value  $z(t)$  and solution point  $x(t)$ .

$$\begin{array}{ll} \text{minimize} & -x_1 + t(2x_1 + x_2) \\ \text{subject to} & -x_1 + x_2 \geq -1 \\ & -x_1 \geq -2 \\ & x_1, x_2 \geq 0 \end{array}$$

